Attachment A

Scope of Work

SCOPE OF WORK FOR

INDEPENDENT TECHNOLOGY PANEL

Purpose:

San Francisco International Airport (SFO) and the San Francisco Bay Conservation and Development Commission (BCDC) have agreed to form an Independent Technology Panel to identify viable technological capacity enhancements that may meet or approach the Purpose and Need of SFO's Runway Reconfiguration Project.

The Federal Aviation Administration (FAA) and City and County of San Francisco Office of Environmental Review (OER) have identified the overall Purpose and Need of the project as follows:

> *The purpose of the proposed improvements to SFO is to **reduce existing and projected flight delays** and accommodate existing and anticipated aircraft, as well as **accommodate projected flight demand**, thereby achieving efficient airport operations **under all weather conditions** while addressing the airport's goal of reducing human exposure to noise.*

Alternatives under consideration that meet this purpose and need include:

- Technological enhancements that would improve the arrival and departure capacity of SFO during a variety of weather conditions.
- Demand management techniques to reduce the number of flights in and out of SFO to a level closer to its adverse weather capacity, possibly by shifting some flights to other airports and/or increasing the size of aircraft serving SFO.
- Reconfiguring the SFO runway system to increase its capacity in all weather conditions.

The Technology Panel will evaluate the extent and viability of improvements in air traffic technology, airspace allocation, and aircraft navigation, control, or communication technologies that, alone or in combination with other measures, may increase the capacity of SFO to address two of the project needs:

1. Reduce existing and projected flight delays.
2. Accommodate projected flight demand.

In conjunction with FAA, OER and BCDC, SFO is conducting a series of separate studies to evaluate non-technology means to meet the project purpose and need without reconfiguration of SFO's runways (generally identified as Demand Management or System Management). In addition, SFO, FAA and OER are separately evaluating alternative means of "reducing human exposure to noise" without runway reconfiguration.

The Technology Panel will focus on potential technologies to improve airfield capacity and/or reduce delays at SFO. Upon completion, the panel will recommend a suite of viable technological capacity enhancements to be included in the project alternatives (both build and no-build), as applicable. These recommendations will take into consideration the availability of technologies and their potential cumulative benefits to improve capacity or reduce delays at SFO.

Subsequent to completion of the work of the Technology Panel and other associated studies, FAA and OER, in consultation with SFO, BCDC and other regulatory agencies, will develop composite alternatives that combine the feasible and viable technologies, separately identified demand management strategies, and noise reduction strategies.

Panel Formation:

The panel shall consist of three members. One panel member shall be designated by SFO and one panel member by BCDC. These two panel members shall identify and agree on a third member, who shall chair the panel.

An advisory group consisting of BCDC's aviation consultants, SFO's staff and consultants and FAA/industry experts will support the panelists. Background materials will be presented to the Panelists upon their selection and the advisors will be available for consultations as needed. No more than four meetings of the Panel are anticipated. The Panel will be invited to public hearings at both BCDC and the San Francisco Airport Commissions to present their findings.

The three Panelists will each receive an honorarium for their service on the Panel. Industry experts will also be paid to serve as resources to the Panel.

Panel Tasks:

1. Review Previous Studies

The first task of the Panel will be to review the previously completed studies on the causes of existing weather related flights delays at SFO, and the use of potential technologies to reduce such delays. The report, "*Existing and Future Flight Delays at SFO,*" (SFO ADB, 2001), which describes the existing flight

modes at SFO and the delays that result when weather conditions are adverse, will be provided to the Panel. Previous studies have evaluated the potential ability of technological improvements to increase the capacity of SFO primarily during adverse weather conditions, will also be provided to the panel, including the following:

1. *Final Report, Analysis of SFO Runway Reconfiguration Impact on Regional Air Transportation Systems, Working Paper 1, Delay Reduction Alternatives,* Section 3: Operational Enhancements, P&D Aviation, March 1999
2. *Regional Airport System Plan, Update 2000, Volume III, Sensitivity Analysis of Factors Affecting Airport Demand and Capacity*, Section 6, Potential Benefits of New Air Traffic Control Technology, RAPC, 2000
3. *SFO Runway Reconfiguration Program EIR/EIS Preliminary Report "New And Emerging Technologies,"* URS Corporation, FAA and OER, November 2000
4. G&C Interim Final Report (BCDC)
5. SFO Response to G&C Reports
6. URS Response to G&C Reports
7. FAA Response to G&C Reports

BCDC staff and their consultants as well as SFO staff and their consultants have reviewed and prepared a list of available technology that should be reviewed by the Technology Panel. The technologies identified include, but are not limited to, the following:

Short Term Solutions (within the next five years):

- PRM/SOIA
- CTAS with Pfast
- Traffic Management Advisor

Mid Term Solutions (five to fifteen years):

- GPS
- GPS enhanced by LAAS or WAAS
- RNP
- ADS-B
- AILS/ADSB with runway separation at 2,500 feet (SFO parallel runways are 750 feet apart).
- AFAST

Long Term Solutions (beyond fifteen years):

- AVOSS (wake vortex detection)
- AILS/ADSB with runway separation at 750 feet (e.g., a technology that would allow for dual parallel arrivals at SFO during all or most weather conditions)

In particular, the panel shall assess the reasonableness of the assumptions used in these previous studies.

To facilitate an understanding of the local and regional air traffic constraints facing SFO, the Panel will tour selected air traffic control facilities. These tours will allow for input from FAA staff regarding the technologies anticipated to be implemented within the ten to fifteen year horizon of the project.

Resource Specialists:

The Panel will have access to at least the following resources to assist in its evaluations:

- FAA Office of Technology Staff
- FAA SFO Tower and TRACON Staff
- SFO Technical Advisors (ATAC)
- BCDC Technical Advisors (G&C)
- FAA EIS Consultant (URS)
- NASA Moffett Field.

These resources will be available as needed during panel deliberations.

Function of the Panel:

The Technology Panel will provide an independent review of all previous work efforts. The Panel will evaluate potentially feasible technologies for application at SFO. The Panel will recommend additional technologies that it considers viable to be implemented within a realistic timeframe of the delivery of a SFO project. For each technology recommended for consideration in the EIR/EIS, the Panel will identify what stage of development the technology currently is in, any associated technology dependence requirements, required regulatory or other approvals, status of pilot and air traffic controller acceptance, purchase costs, required training for implementation and any potential “risks” associated with the use of the technology.

The Panel will focus its analysis on technologies anticipated to be available within the 2005 – 2015 project horizon. The Panel recognizing the time frames and risks normally associated with the implementation of new technologies in air traffic, should use the following guidelines in assessing the viability of potential technologies.

- The technology concept must be proven.
- The FAA will have to certify the technology as safe and consistent with the National Airspace System.
- Manufacturers must design, build, and certify any required equipment.
- If the technology requires ground equipment, the siting of such equipment may require approval under the National Environmental Policy Act (NEPA), the California Environmental Quality Act (CEQA), and other environmental regulations.
- If the technology requires equipment installation in aircraft, the equipment, installation and training must be certified for each class/design of aircraft.

Expected Outcome:

It is expected that the Panel will provide a report summarizing its findings and recommendations. The report will include comments on the previous technology work products already prepared for SFO. The report is also expected to discuss any differing analyses in the various studies already prepared as part of SFO's on-going analysis. This includes RAPC, URS and G&C. The Panel will reach its own independent conclusions regarding these differences. Finally, the Panel is expected to offer its suggestions as to which technologies should be considered as part of the "no-build" alternatives for analysis in the EIR/EIS, along with an assessment of their potential cumulative benefits to improve capacity at SFO; and which technologies should be considered as part of the "build" alternatives (where SFO is reconfigured with one or two pairs of adequately spaced runways) for analysis in the EIR/EIS, along with an assessment of their potential cumulative benefits to improve capacity at SFO.

The panel report shall present the consensus findings of all three panel members. Where the panel is unable to reach agreement on specific issues, the report shall present the differing views and discuss the reasons for these differences.